



**STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

DIVISION OF UNDERGROUND STORAGE TANKS

COMPLIANCE GUIDANCE DOCUMENT - 103

**EFFECTIVE DATE- July 29, 1996
(REVISION DATE - July 19, 1999)**

RE: REQUIREMENTS FOR MANUAL TANK GAUGING

The purpose of this guidance document is to assist the regulated community in understanding the regulatory requirements for manual tank gauging. Manual tank gauging is allowed by *Rule 1200-1-15-.04(3)(b)* Manual tank gauging, and *Rule 1200-1-15-.04(3)(h)* Other methods.

Rule 1200-1-15-.04 (3) (b) states the following:

Manual tank gauging. Manual tank gauging tank meet the following requirements:

- 1. Tank liquid level measurements are taken at the beginning and ending of a period of at least 36 hours during which no liquid is added to or removed from the tank;*
- 2. Level measurements are based on an average of two consecutive stick readings at both the beginning and ending of the period;*
- 3. The equipment used is capable of measuring the level of petroleum over the full range of the tank's height to the nearest one-eighth of an inch;*
- 4. A leak is suspected and subject to the requirements of Rule 1200-1-15- .05 if the variation between beginning and ending measurements exceeds the weekly or monthly standards in the following table:*

<i>Nominal Tank Capacity</i>	<i>Weekly Standard (one test)</i>	<i>Monthly Standard (Average of 4 tests)</i>
<i>550 gallons or less</i>	<i>10 gallons</i>	<i>5 gallons</i>
<i>551-1000 gallons</i>	<i>13 gallons</i>	<i>7 gallons</i>
<i>1001-2000 gallons</i>	<i>26 gallons</i>	<i>13 gallons</i>

- 5. Only tanks of 550 gallons or less nominal capacity may use this as the sole method of release detection. Tanks of 551 to 2000 gallons may use the method in place of manual inventory*

control in Rule 1200-1-15-.04(3)(a). Tanks of greater than 2000 gallons nominal capacity may not use this method to meet the requirements of this rule.

Note: Current regulations only allow manual tank gauging as a sole method of release detection for tanks 550 gallons or less. However, EPA issued a memorandum dated October 18, 1990 which allows the use of this method as a sole method of leak detection on tanks 1,000 gallons or less provided that certain criteria can be met. This is allowable under 1200-1-15-.04(3)(h), and is covered in the CGD on page 2, REQUIREMENTS FOR MANUAL TANK GAUGING and in attached Table 1.

Rule 1200-1-15-.04 (3) (h) states the following:

Other methods. Any other type of release detection method, or combination of methods, can be used if:

- 1. It can detect a 0.2 gallon per hour leak rate or a release of 150 gallons within a month with a probability of detection of 0.95 and a probability of false alarm of 0.05; or*
- 2. The Division may approve another method if the owner and operator can demonstrate that the method can detect a release as effective as any of the methods allowed in subparagraphs (c)-(h) of Rule 1200-1-15-.04(3). In comparing methods, the Division shall consider the size of release that the method can detect and the frequency and reliability with which it can be detected. If the method is approved, the owner and operator must comply with any conditions imposed by the Division on its use to ensure the protection of human health and the environment.*

INTRODUCTION

Manual tank gauging is an effective, easy, and inexpensive release detection method for small volume tanks. The liquid level is measured in a tank at the beginning and ending of an established time period. Any change in liquid level is used to calculate the change in volume, which is compared against established standards to determine whether any differences in the measurements is significant enough to suspect that a release has or has not occurred. Manual tank gauging is sometimes confused with inventory control. Although both methods usually involve “sticking the tank”, manual tank gauging is a weekly test, while, in contrast, inventory control is an ongoing, daily inventory of an operating tank for an entire month. For more information on inventory control see CGD - 102.

REQUIREMENTS FOR MANUAL TANK GAUGING

Manual tank gauging is only applicable to tanks of 2000 gallons nominal capacity or less. Manual tank gauging must be conducted weekly for an established test duration of at least 36 hours. This test duration may be longer if periodic tightness testing is not performed and the diameter of the tank requires a longer test. Weekly tests and monthly tests must be performed and reconciled with a set standard to determine the status of the tank. Weekly and monthly standards may vary according to tank capacity and/or diameter.

Weekly standards, monthly standards, and test duration are outlined in **TABLE 1**.

Tank Tightness Test Requirements

Only tanks of 1000 gallons or smaller and that are able to meet test duration requirements, may use manual tank gauging as a sole method of release detection. Tanks from 1001 to 2000 gallons capacity can use manual tank gauging only when it is **combined** with a periodic tank tightness test in accordance with *Rule 1200-1-15-.04(3)(c)*. For more information on tank tightness testing see CGD - 112.

The **combined** method of manual tank gauging and tank tightness testing is a TEMPORARY release detection method. The combined method can only be used for 10 years after new tank installations, or for 10 years after upgrades of existing tanks, or until December 22, 1998, whichever is later.

Tanks that meet performance standards for new and/or upgraded tanks (corrosion protection and spill/overflow protection) must have tightness testing performed at least every five years. Tanks that do not meet performance standards must have an annual tightness test.

After the 10 year period you must use a monthly monitoring method, such as automatic tank gauging, groundwater monitoring, vapor monitoring, statistical inventory reconciliation (SIR), or interstitial monitoring. For more information concerning these release detection methods please see Compliance Guidance Documents (CGDs) - 104, 105, 106, 107, and 108, respectively. For more information concerning tank tightness testing please see Compliance Guidance Document (CGD) - 112.

Weekly and Monthly Tests

Weekly tests are calculated by determining the net change (in gallons) between the beginning and ending of the test period. Each product level measurement must be an average of two (2) consecutive measurements. During the entire manual tank gauging event, no product may be placed into or taken from the tank.

All liquid level measuring equipment must be able to measure the product stored over the full range of the tanks height to the nearest one-eighth inch. If a stick is used to measure product level, then it must be graduated in one-eighth increments and the entire length must be legible. Appropriate calibration charts for the tank must be on-site and be available during a Division inspection.

When the weekly test is completed, the net change (positive or negative) of product level should be compared to the weekly standard referenced in Table 1. At the end of each month all four of the weekly test results should be calculated. Pay careful attention to positive and negative numbers to get the total. For example, +5 and +3 and -2 and -2 should equal +4. After the sum of the weekly tests is calculated, divide by the number of weekly tests to get the monthly test average. If the monthly test average exceeds the monthly or weekly standard (see **TABLE 1**), then the Division must be notified within 72 hours of a suspected release.

REPORTING AND RECORDKEEPING

If monitoring results from the manual tank gauging tests (weekly or monthly) indicate the tank system may have had a release, then the owner and/or operator shall notify the Division within 72 hours and begin release investigation and confirmation steps in accordance with *Rule 1200-1-15-.05 (3)*. If the monitoring device was determined to be defective and a suspected release was not reported to the Division, documentation shall be maintained demonstrating that the device was defective. Be prepared to justify with Documentation why any release, as indicated by monitoring results, was not reported.

If the results from any tightness testing indicate the tank and/or lines may have had a release of petroleum, then the Division must be notified within 72 hours of a confirmed release. Owners and/or operators must take immediate action to prevent any further release of the petroleum into the environment, and take immediate action to identify and mitigate fire, explosion, and vapor hazards. Owners and/or operators must repair, replace, or upgrade the tank and/or piping, and begin corrective action in accordance with *Rule 1200-1-15-.06* if the test results for the system, tank, or delivery piping indicate that a leak exists.

The last twelve months of manual tank gauging records must be maintained. If applicable, the results of the most recent tank tightness test must be maintained.

Records of all calibration, maintenance, and repairs of release detection equipment permanently located on-site must be maintained for at least one year after the servicing work is completed. Any schedules of required calibration and maintenance provided by the release detection equipment manufacturer must be retained for five (5) years from the date of installation. Note: Records of tank system repairs must be maintained for the life of the tank system.

Records must be kept at the site or at a readily available alternative site and be immediately available for inspection by the Division.

ADDITIONAL INFORMATION

Manual Tank Gauging For Small Underground Storage Tanks, November 1993, EPA Publication Number: 510-B-93-005

A free copy of this publication can be obtained by contacting your local Environmental Assistance Center or at the Nashville Central Environmental Assistance Center, phone (615) 532-0945. This publication also contains a manual tank gauging record for your use.

(Note: Tanks that are filled by transfers of no more than 25 gallons at one time are not required to have spill/overflow devices.)

TABLE 1

TANK SIZE	MINIMUM DURATION TEST	OF	WEEKLY STANDARD	MONTHLY STANDARD
up to 550 gallons	36 hours		10 gallons	5 gallons
551-1000 gallons (diameter 64 in.)	44 hours		9 gallons	4 gallons
551-1000 gallons (diameter 48 in.)	58 hours		12 gallons	6 gallons
551-1000 gallons*	36 hours		13 gallons	7 gallons
1001-2000 gallons**	36 hours		26 gallons	13 gallons

* For all tanks of 551-1000 gallon capacity that cannot meet test duration requirements over 36 hours, a periodic tank tightness test must be performed.

** Must be combined with periodic tank tightness testing.